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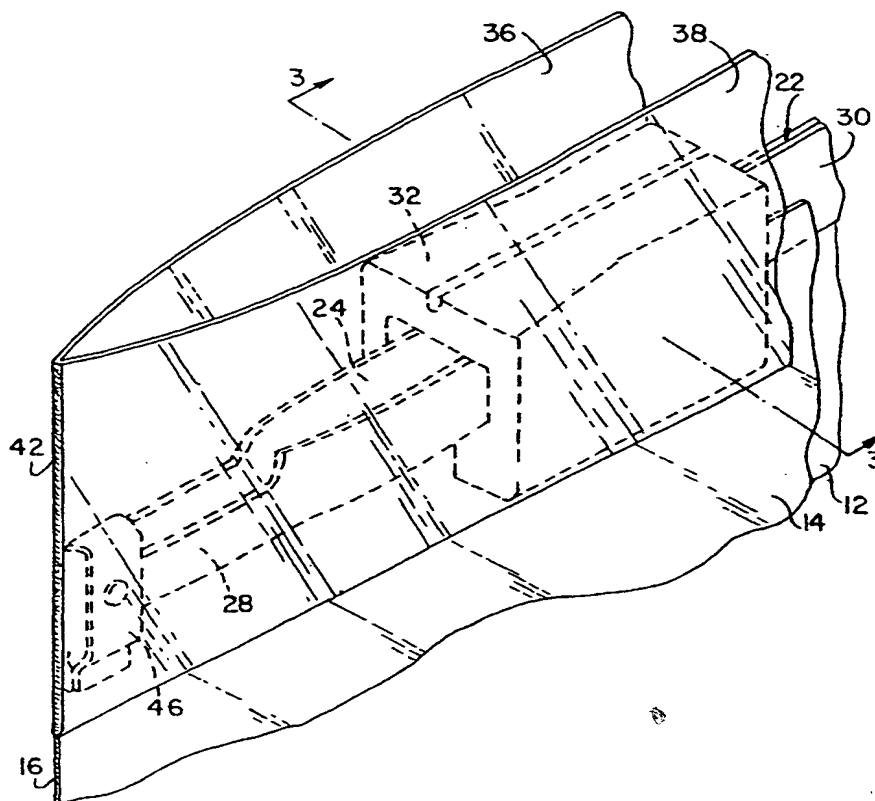
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(54) Title: **PLASTIC BAG WITH ZIPPER SLIDER AND END TERMINATIONS CAPTURED IN POCKET**



(57) Abstract: A reclosable plastic bag includes first and second opposing body panels (12, 14) connected to each other along a pair of sides and a bottom. The bag is provided with a reclosable zipper (22) extending along a mouth. A slider (32) is slidably mounted to the zipper. First and second upstanding panels (36, 38) extend upwardly from the respective first and second body panels. Each of the upstanding panels form an open pocket with seals (42, 44) at the opposite ends. The zipper and slider are captured in the pocket. First and second end terminations (46, 48), distinct from the pocket seals, are disposed at opposing ends of the zipper and adjacent to the respective pocket seals.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

PLASTIC BAG WITH ZIPPER SLIDER AND END TERMINATIONS CAPTURED IN POCKET

FIELD OF THE INVENTION

The present invention generally relates to reclosable plastic bags and, more particularly, to a reclosable plastic bag including a zipper slider and end terminations captured in a pocket having seals at its opposite ends. The use of end terminations, distinct from the pocket seals, allows the bag to be substantially made of a low cost plastic material such as polyethylene, but at the same time consistently terminate slider movement near the opposite ends of the pocket without rupturing the pocket seals.

BACKGROUND OF THE INVENTION

A reclosable plastic bag typically includes first and second opposing panels fixedly connected to each other along a pair of sides and a bottom bridging the pair of sides. The first and second panels are not fixedly connected along a mouth, which is formed opposite to the closed bottom. Rather, the bag is provided with a reclosable zipper extending along the mouth of the plastic bag. The zipper includes a male track and a female track. In reclosable plastic bags of the type disclosed in U.S. Patent No. 5,713,669 utilizing a slider to open the zipper, the male track typically includes a male profile and a first fin extending downward from the male profile. Likewise, the female track in such bags with sliders includes a female profile and a second fin extending downward from the female profile. The first and second fins are thermally fused to, or integrally formed with, the respective first and second panels.

The male and female tracks are typically free of any plastic material above the male and female profiles in order to permit proper mounting and movement of the slider. The male and female profiles are releasably engageable to each other. When the slider is in a closed position, the male and female profiles are interlocked with each other. In response to moving the slider to an open position, the male and female profiles are disengaged from each other. Once the male and female profiles are disengaged from each other, access to the interior of the bag may be obtained by pulling the first and second panels apart at the mouth.

First and second upstanding panels are fixedly connected, or integrally formed with, the respective first and second opposing body panels. Each of the upstanding panels includes opposing ends, and the opposing ends of the first upstanding panel are connected to the respective opposing ends of the second upstanding panel to form an open pocket with seals at its opposite ends. The zipper and the slider are captured in the pocket. The open pocket

effectively creates end terminations that serve to prevent the slider from going past the ends of the zipper and to provide adequate end strength that resists stresses applied to the profiles during normal use of the bag. To minimize tampering with the plastic bag, the open pocket may be sealed by joining the first and second upstanding panels to each other above the slider
5 so as to completely encapsulate the slider within the pocket.

It is desirable to produce the above-mentioned plastic bags with a low cost, yet relatively strong material, such as polyethylene. Because of the low melt strength of polyethylene, however, seals such as those at the opposite ends of the pocket are preferably burn-off seals generated with a hot knife or hot wire. Other techniques for generating such
10 seals are less desirable because they can cause the low melt material to stretch. Although the burn-off seals at the opposite ends of the pocket do not cause such stretching in the low melt material, the burn-off seals are relatively narrow in dimension and therefore weak compared to other types of seals. As a result, the burn-off seals may rupture in response to contacting the slider against the burn-off seals with excessive force when the slider is moved to the
15 closed or open position. If one of the burn-off seals were ruptured, that burn-off seal would no longer function to terminate movement of the slider at the end of the zipper containing the burn-off seal.

Accordingly, a need exists for a reclosable plastic bag of the above type that can be substantially made of a low cost plastic material such as polyethylene, but at the same time
20 can consistently terminate slider movement near the opposite ends of the sealed pocket without rupturing the burn-off seals.

SUMMARY OF THE INVENTION

A reclosable plastic bag includes first and second opposing body panels fixedly connected to each other along a pair of sides and a bottom bridging the pair of sides. The bag
25 is provided with a reclosable zipper extending along a mouth formed opposite the closed bottom of the plastic bag. A slider is slidably mounted to the zipper. The slider opens the zipper in response to movement of the slider toward an open position, and the slider closes the zipper in response to movement of the slider toward a closed position.

First and second upstanding panels extend upwardly from the respective first and
30 second body panels. Each of the upstanding panels includes opposing ends, and the opposing ends of the first upstanding panel are connected to the respective opposing ends of the second upstanding panel to form an open pocket with seals at its opposite ends. The zipper and the

slider are captured in the pocket. To minimize tampering with the plastic bag, the open pocket may be sealed by joining the first and second upstanding panels to each other above the slider so as to completely encapsulate the slider within the pocket.

First and second end terminations, distinct from the seals at the opposite ends of the pocket, are disposed at opposing ends of the zipper and adjacent to the respective pocket seals. The first end termination terminates movement of the slider at the closed position. The second end termination terminates movement of the slider at the open position. The use of the end terminations, distinct from the seals at the opposite ends of the pocket, allows the body panels and the upstanding panels of the pocket to be made of a low cost material such as polyethylene. The end terminations take the function of terminating movement of the slider away from the pocket seals and can consistently terminate such slider movement without being ruptured.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

FIG. 1 is an isometric view of a mouth portion of a reclosable plastic bag showing a slider captured within a pocket;

FIG. 2 is a front view of the bag mouth portion in FIG. 1;

FIG. 3 is a sectional view taken generally along the line 3-3 in FIG. 1;

FIG. 4 is an isometric view of the reclosable plastic bag showing the slider captured within a sealed pocket;

FIG. 5 is an isometric view of the reclosable plastic bag in FIG. 4 showing the seal on the pocket in the process of being broken;

FIG. 6 is an isometric view similar to FIG. 1 but showing an end termination according to a first alternative embodiment of the present invention;

FIG. 7 is an isometric view similar to FIG. 1 but showing an end termination according to a second alternative embodiment of the present invention;

FIG. 8 is an isometric view similar to FIG. 1 but showing an end termination according to a third alternative embodiment of the present invention;

FIG. 9 is an isometric view similar to FIG. 1 but showing an end termination according to a fourth alternative embodiment of the present invention;

FIG. 10 is an isometric view similar to FIG. 1 but showing an end termination according to a fifth alternative embodiment of the present invention; and

FIG. 11 is an isometric view similar to FIG. 1 but showing an end termination according to a sixth alternative embodiment of the present invention.

5 While the invention is susceptible to various modifications and alternative forms, a specific embodiment thereof has been shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that it is not intended to limit the invention to the particular forms disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the
10 invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to the drawings, FIGS. 1-3 depict a mouth portion of a reclosable plastic bag embodying the present invention. The plastic bag comprises first and second opposing body panels 12 and 14 fixedly connected to each other along a pair of sides 16 and 18 (see
15 FIGS. 4 and 5) and a bottom 20 (see FIGS. 4 and 5) bridging the pair of sides 16 and 18. The bag is provided with a reclosable zipper 22 extending along the mouth portion, which is formed opposite the closed bottom 20 of the plastic bag.

The zipper 22 includes a male track and a female track. The male track includes a male profile 24 and a first depending fin or flange 26 extending downward from the male
20 profile 24. Likewise, the female track includes a female profile 28 and a second depending fin or flange 30 extending downward from the female profile 28. If the zipper 22 is formed separately from the body panels 12 and 14 of the bag, the first and second fins 26 and 30 are thermally fused to inner surfaces of the respective first and second body panels 12 and 14. Alternatively, the zipper 22 may be extruded with the panels 12 and 14 such that the first fin
25 26 is integrally formed with the first body panel 12 and the second fin 30 is integrally formed with the second body panel 14.

To assist in opening the plastic bag, a slider 32 is slidably mounted to the zipper 22 for movement between a closed position and an open position. In the closed position of the slider 32, the male and female profiles 24 and 28 are interlocked with each other. Movement
30 of the slider 32 from the closed position toward the open position disengages the male and female profiles 24 and 28 from each other and allows a user to gain access to the interior of the plastic bag. Further details concerning the construction and operation of the zipper 22

and slider 32 may be obtained from U.S. Patent No. 5,067,208 to Herrington, Jr. et al., which is incorporated herein in its entirety by reference.

First and second upstanding panels 36 and 38 extend upwardly from the respective first and second body panels 12 and 14. The first and second upstanding panels 36 and 38 are integrally formed with the respective first and second body panels 12 and 14. Alternatively, the first upstanding panel 36 is separately formed from the first body panel 12, and a lowermost strip 36a (FIG. 3) of the first upstanding panel 36 is later thermally fused to an outer surface of an uppermost strip of the first body panel 12. Likewise, in this alternative embodiment, the second upstanding panel 38 is separately formed from the second body panel 14, and a lowermost strip 38a (FIG. 3) of the second upstanding panel 38 is later thermally fused to an outer surface of an uppermost strip of the second body panel 14.

Each of the upstanding panels 36 and 38 includes opposing vertical ends in line with the sides 16 and 18, and the opposing vertical ends of the first upstanding panel 36 are thermally fused to the respective opposing vertical ends of the second upstanding panel 38 along the sides 16 and 18 to form a pocket having seals 42 and 44 (see FIG. 4) at its opposite ends. The slider 32 and zipper 22 are captured in the pocket. The pocket serves to provide adequate end strength that resists stresses applied to the profiles 24 and 28 during normal use of the bag.

Referring now to FIGS. 4 and 5, if the plastic bag is used to prepackage food products such as deli meats and cheeses, which are later sold in a grocery store, it is desirable to provide the plastic bag with a tamper-evident feature. The first and second upstanding panels 36 and 38 are ideally suited for this purpose. To minimize tampering with the plastic bag, upper edges of the respective first and second upstanding panels 36 and 38 are joined to each other to seal the pocket and completely encapsulate the slider 32 and zipper 22 within the sealed pocket. The upper edges of the respective first and second upstanding panels 36 and 38 may be joined to each other either by thermal fusion or by integrally forming these upper edges with each other. When the upper edges are integrally formed with each other, the first and second upstanding panels are created from a single folded piece of film where the fold is disposed along the upper edges and the slider 32 and zipper 22 are effectively located in the area of the fold.

To permit a consumer to gain access to the interior of the plastic bag when the pocket is sealed for tamper-evident purposes, the sealed pocket is preferably provided with a one-

time breakable seal. If the consumer purchases a prepackaged plastic bag with the one-time breakable seal intact, it is highly unlikely that the contents of the plastic bag have been tampered with because the zipper 22 cannot easily be opened without breaking the seal. Even if the zipper 22 could be opened without breaking the seal, access to the interior of the plastic bag via the opened zipper 22 is difficult because the zipper 22 is still encapsulated in the sealed pocket. If, on the other hand, the consumer purchases a plastic bag with the one-time breakable seal broken, then it is more likely that the contents of the plastic bag have been tampered with.

The one-time breakable seal for restricting access to the slider 32 and zipper 22 may take several forms. For example, the upstanding panels 36 and 38 may include respective parallel lines of weakness 40 extending between the sides 16 and 18 of the bag and oriented generally parallel to the zipper 22. The lines of weakness 40 may be perforated lines, score lines, or thinned/die lines (less plastic extruded along the lines). To break such a one-time breakable seal, a consumer tears away upper portions of the upstanding panels 36 and 38 along the lines of weakness 40 as shown in FIG. 5. The upstanding panels 36 and 38 may be thermally fused to each other above the lines of weakness 40 to facilitate grasping and subsequent tearing of the upstanding panels 36 and 38. In another embodiment, a single line of weakness is formed at the juncture of the uppermost edges of the upstanding panels 36 and 38.

In yet another embodiment, the one-time breakable seal takes the form of a peelable seal. To create the peelable seal, the inner surfaces of one or both of the upstanding panels 36 and 38 above the slider 32 and zipper 22 are detachably connected to each other by a tacky adhesive-like substance that is well-known in the art.

In a further embodiment, the first and second upstanding panels 36 and 38 are fixedly connected to each other and no line of weakness is formed along or at the juncture of the panels. In this embodiment, the consumer gains entrance into the sealed pocket formed by the joined panels 36 and 38 by cutting off upper portions of the upstanding panels 36 and 38 with a cutting device such as a scissors, knife, or the like.

Referring to FIGS. 1 and 4, first and second end terminations 46 and 48, distinct from the seals 42 and 44 at the opposite ends of the pocket, are disposed at opposing ends of the zipper 22 and adjacent to the respective pocket seals 42 and 44. The first end termination 46 terminates movement of the slider 32 at the closed position. The second end termination 48

terminates movement of the slider at the open position. The end terminations 46 and 48 perform the dual function of stops for the ends of the zipper 22 to prevent the slider 32 from going past the ends of the zipper 22 and, in addition, they hold the male and female profiles 24 and 28 together to resist stresses applied to the profiles during normal use of the plastic bag.

Each of the end terminations 46 and 48 comprises a strap that wraps over the top of the zipper. One end of the strap is provided with a rivet-like member that penetrates through the zipper fins and into a cooperating opening at the other end of the strap. Further information concerning the end terminations 46 and 48 may be obtained from U.S. Patent Nos. 5,067,208 and 5,161,286 to Herrington, Jr. et al., which are incorporated herein by reference. Instead of a strap, the end termination may simply be a post or rivet 50 extending through the zipper, as depicted in FIG. 6. To prevent the post from being dislodged from the zipper, opposite ends of the post are melted to provide such opposite ends with enlarged heads.

Referring to FIGS. 7 through 11, the end terminations may take on various other forms. As depicted in FIG. 7, an end termination 52 comprises the material at an end of the zipper and protruding therefrom. In one embodiment, the end termination 52 is formed by cutting the zipper with a heated knife and forcing the melted zipper material into cavities in clamps adjacent to the heated knife. In another embodiment, the end termination 52 is formed by ultrasonically smashing an adjacent area of the zipper with a pair of anvils. Further information concerning the end termination 52 may be obtained from U.S. Patent Nos. 5,088,971 and 5,131,121 to Herrington, which are incorporated herein by reference.

As depicted in FIG. 8, an end termination 54 comprises a length of slit plastic tubing extending over and bonded to the zipper. The end termination 54 includes deformations impressed through the wall of the tubing and into the profiles of the zipper. Further information concerning the end termination 54 may be obtained from U.S. Patent Nos. 5,405,478 and 5,482,375 to Richardson et al., which are incorporated herein by reference.

As depicted in FIG. 9, an end termination 56 comprises adjacent segments of the zipper profiles fused to each other. Further information concerning the end termination 56 may be obtained from U.S. Patent No. 5,442,837 to Morgan, which is incorporated herein by reference.

As depicted in FIG. 10, an end termination 58 comprises a plastic clip fused with the zipper into a single mass by melting the clip to the zipper material. Further information concerning the end termination 58 may be obtained from U.S. Patent No. 5,448,807 to Herrington, Jr. et al., which is incorporated herein by reference.

5 As depicted in FIG. 11, an end termination 60 comprises a fairly rigid, profiled clip attached to an end of the zipper. The clip has an inner profile complementary to an outer profile of the zipper. Further information concerning the end termination 60 may be obtained from U.S. Patent No. 5,833,791 to Bryniarski et al., which is incorporated herein by reference.

10 The use of the end terminations, distinct from the seals 42 and 44 at the opposite ends of the pocket, allows the body panels 12 and 14 and the upstanding panels 36 and 38 of the pocket to be made of a low cost material such as polyethylene. The end terminations take the function of terminating movement of the slider away from the pocket seals 42 and 44 and can consistently terminate such slider movement without being ruptured.

15 While the present invention has been described with reference to one or more particular embodiments, those skilled in the art will recognize that many changes may be made thereto without departing from the spirit and scope of the present invention. Each of these embodiments and obvious variations thereof is contemplated as falling within the spirit and scope of the claimed invention, which is set forth in the following claims.

WHAT IS CLAIMED IS:

1. A reclosable plastic bag, comprising:

first and second opposing body panels joined to each other along a pair of sides and a bottom bridging said pair of sides;

5 a zipper extending along a mouth formed opposite said bottom from one of said pair of sides to the other of said pair of sides;

a slider slidably mounted to said zipper, said slider opening said zipper in response to movement of said slider toward an open position, said slider closing said zipper in response to movement of said slider toward a closed position;

10 first and second upstanding panels extending upwardly from said respective first and second body panels, each of said first and second upstanding panels including first and second opposing ends, said first and second opposing ends of said first upstanding panel being connected to said respective first and second opposing ends of said second upstanding panel to form a pocket having seals at its opposite ends; and

15 first and second end terminations, distinct from said pocket seals, disposed at opposing ends of said zipper and adjacent to said respective pocket seals, said first end termination terminating movement of said slider at said closed position, said second end termination terminating movement of said slider at said open position.

2. The bag of claim 1, wherein said first and second upstanding panels are
20 integrally formed with said respective first and second body panels.

3. The bag of claim 1, wherein said first and second upstanding panels are separately formed from said respective first and second body panels and then attached to said respective first and second body panels.

4. The bag of claim 1, wherein said first and second upstanding panels are joined
25 to each other above said slider to seal said pocket and fully encapsulate said slider within said sealed pocket.

5. The bag of claim 1, wherein said zipper includes a first track with a first profile and a second track with a second profile, said first and second profiles being fused to each other at segments adjacent to said respective pocket seals to provide said end terminations.

30 6. The bag of claim 1, wherein each of said end terminations includes a strap and a rivet, said strap extending over a top of said zipper and having first and second strap

portions disposed on opposite sides of said zipper, said first and second strap portions being connected to each other by a rivet extending through said zipper.

7. The bag of claim 1, wherein each of said end terminations includes a post extending through said zipper.

5 8. The bag of claim 1, wherein each of said end terminations includes a clip attached to said zipper.

9. The bag of claim 8, wherein said clip is fused to said zipper.

10. The bag of claim 1, wherein each of said end terminations includes plastic material protruding outwardly from said zipper.

10 11. The bag of claim 10, wherein said plastic material originates from said zipper itself.

12. The bag of claim 1, wherein each of said end terminations includes a segment of slit plastic tubing extending over and bonded to said zipper.

13. The bag of claim 12, wherein said segment includes deformations impressed
15 into said zipper.

14. The bag of claim 1, wherein said first and second body panels and said first and second upstanding panels are comprised of polyethylene.

15. In a reclosable plastic bag including first and second opposing body panels joined to each other along a pair of sides and a bottom bridging said pair of sides;

20 a zipper extending along a mouth formed opposite said bottom from one of said pair of sides to the other of said pair of sides; a slider slidably mounted to said zipper, said slider opening said zipper in response to movement of said slider toward an open position, said slider closing said zipper in response to movement of said slider toward a closed position, an arrangement comprising:

25 first and second upstanding panels extending upwardly from said respective first and second body panels, each of said first and second upstanding panels including first and second opposing ends, said first and second opposing ends of said first upstanding panel being connected to said respective first and second opposing ends of said second upstanding panel to form a pocket having seals at its opposite ends; and

30 first and second end terminations, distinct from said pocket seals, disposed at opposing ends of said zipper and adjacent to said respective pocket seals, said first end

termination terminating movement of said slider at said closed position, said second end termination terminating movement of said slider at said open position.

16. The arrangement of claim 15, wherein said first and second upstanding panels
5 are integrally formed with said respective first and second body panels.

17. The arrangement of claim 15, wherein said first and second upstanding panels are separately formed from said respective first and second body panels and then attached to said respective first and second body panels.

18. The arrangement of claim 15, wherein said first and second upstanding panels
10 are joined to each other above said slider to seal said pocket and fully encapsulate said slider within said sealed pocket.

19. The arrangement of claim 15, wherein said zipper includes a first track with a first profile and a second track with a second profile, said first and second profiles being fused to each other at segments adjacent to said respective pocket seals to provide said end
15 terminations.

20. The arrangement of claim 15, wherein each of said end terminations includes a strap and a rivet, said strap extending over a top of said zipper and having first and second strap portions disposed on opposite sides of said zipper, said first and second strap portions being connected to each other by a rivet extending through said zipper.

20 21. The arrangement of claim 15, wherein each of said end terminations includes a post extending through said zipper.

22. The arrangement of claim 15, wherein each of said end terminations includes a clip attached to said zipper.

23. The arrangement of claim 22, wherein said clip is fused to said zipper.

25 24. The arrangement of claim 15, wherein each of said end terminations includes plastic material protruding outwardly from said zipper.

25. The arrangement of claim 24, wherein said plastic material originates from said zipper itself.

26. The arrangement of claim 15, wherein each of said end terminations includes a
30 segment of slit plastic tubing extending over and bonded to said zipper.

27. The arrangement of claim 26, wherein said segment includes deformations impressed into said zipper.

28. The arrangement of claim 15, wherein said first and second body panels and said first and second upstanding panels are comprised of polyethylene.

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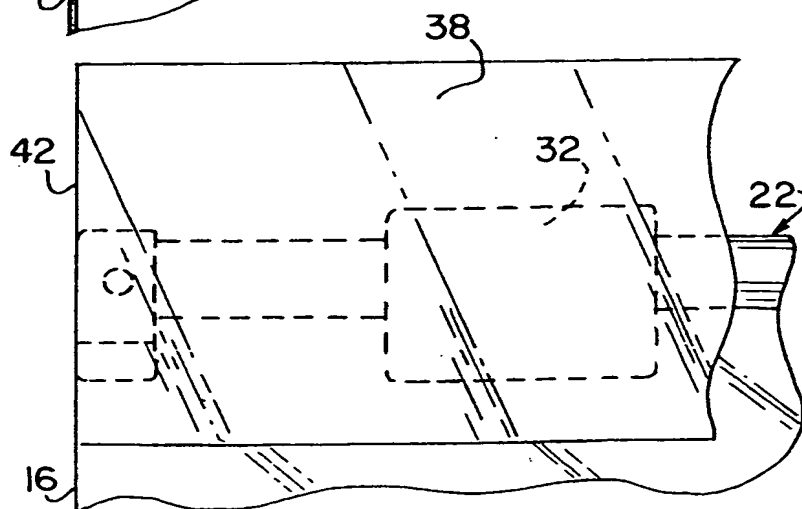
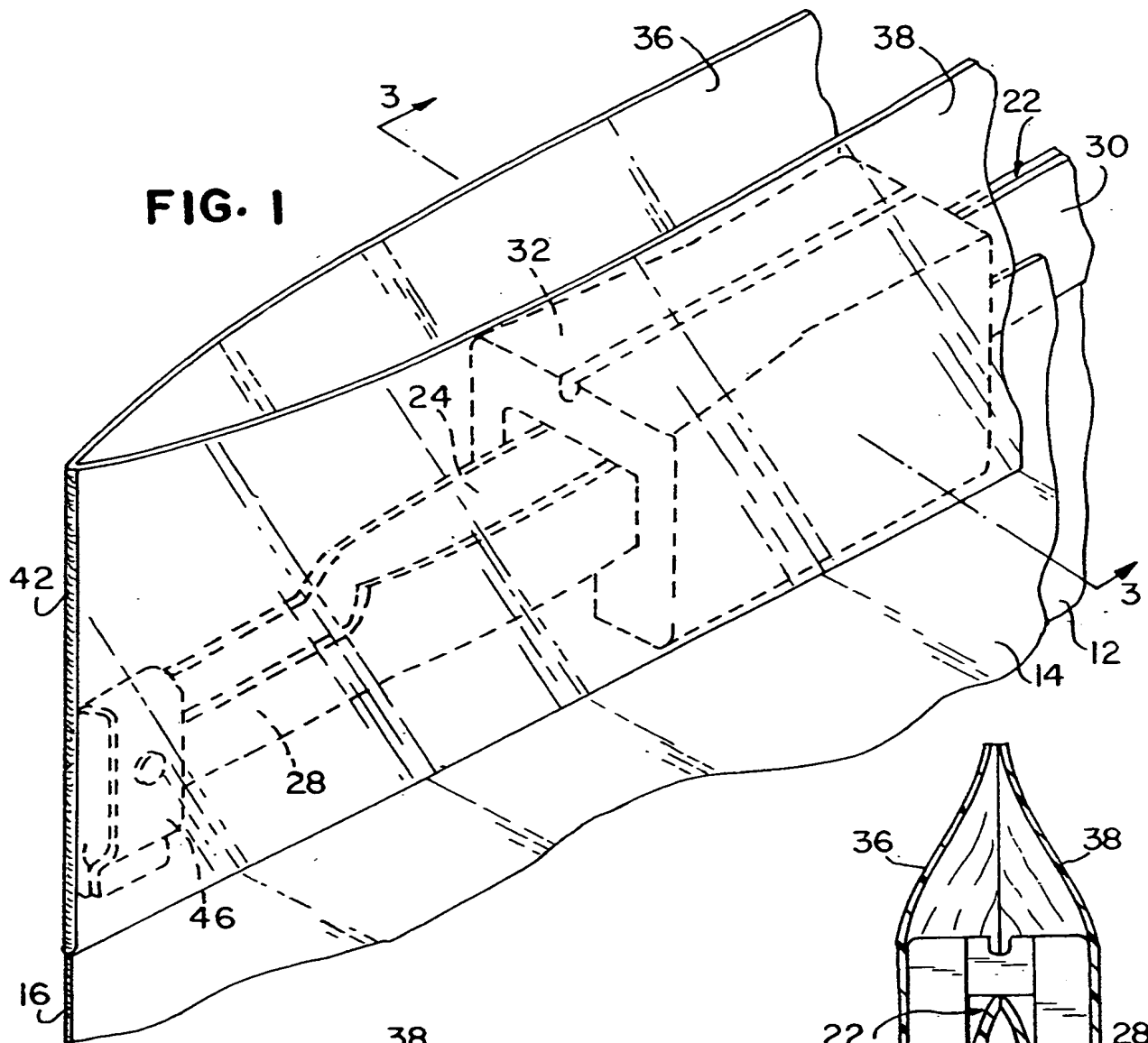


FIG. 2
SUBSTITUTE SHEET (RULE 26)

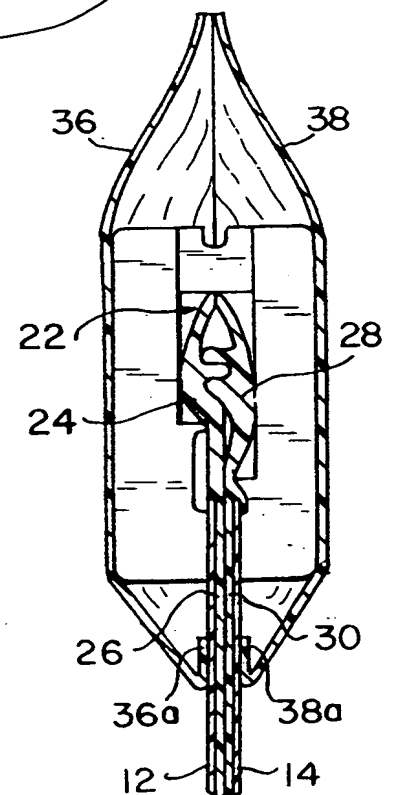
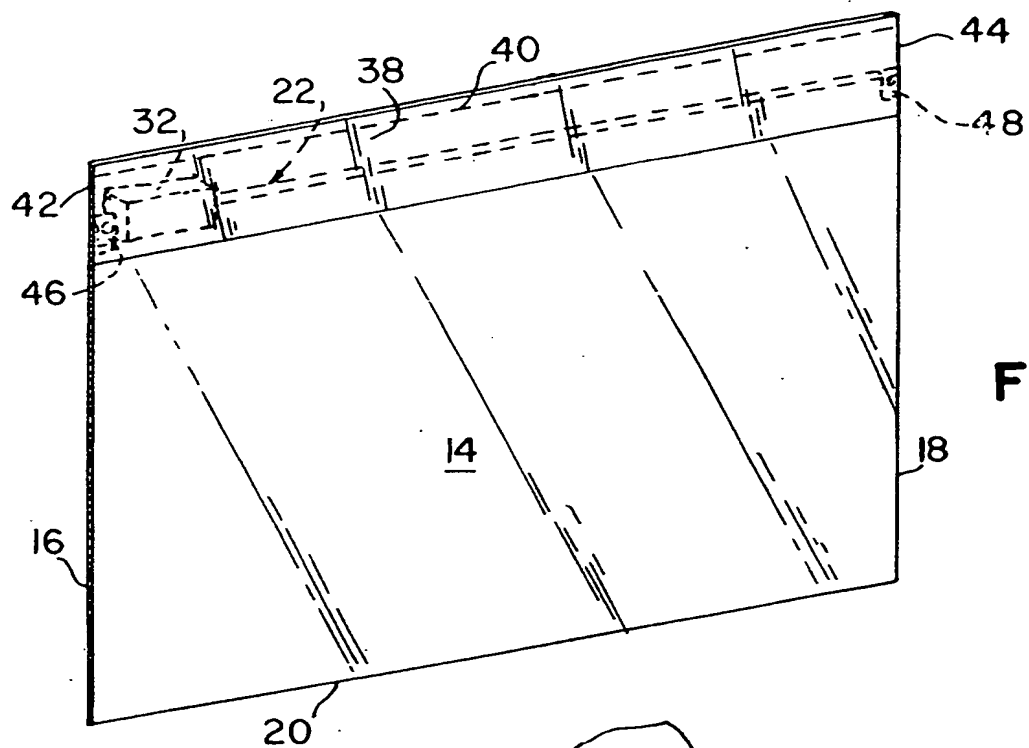
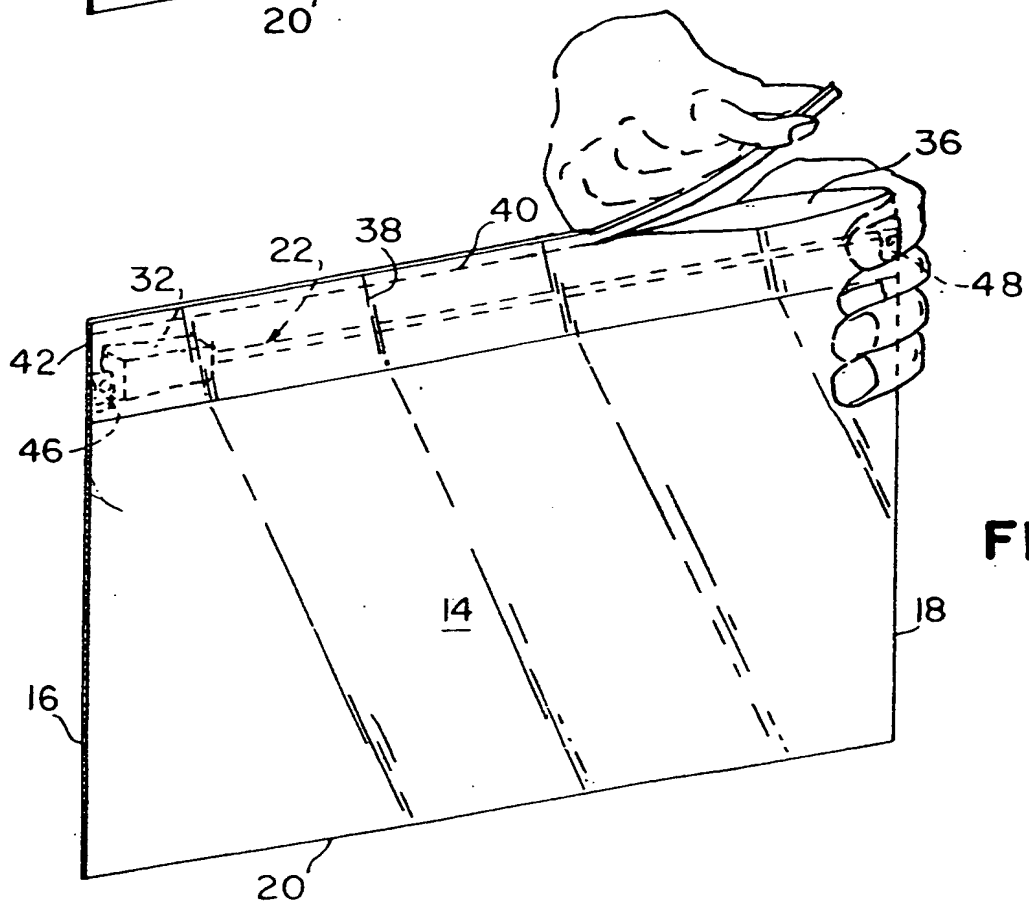


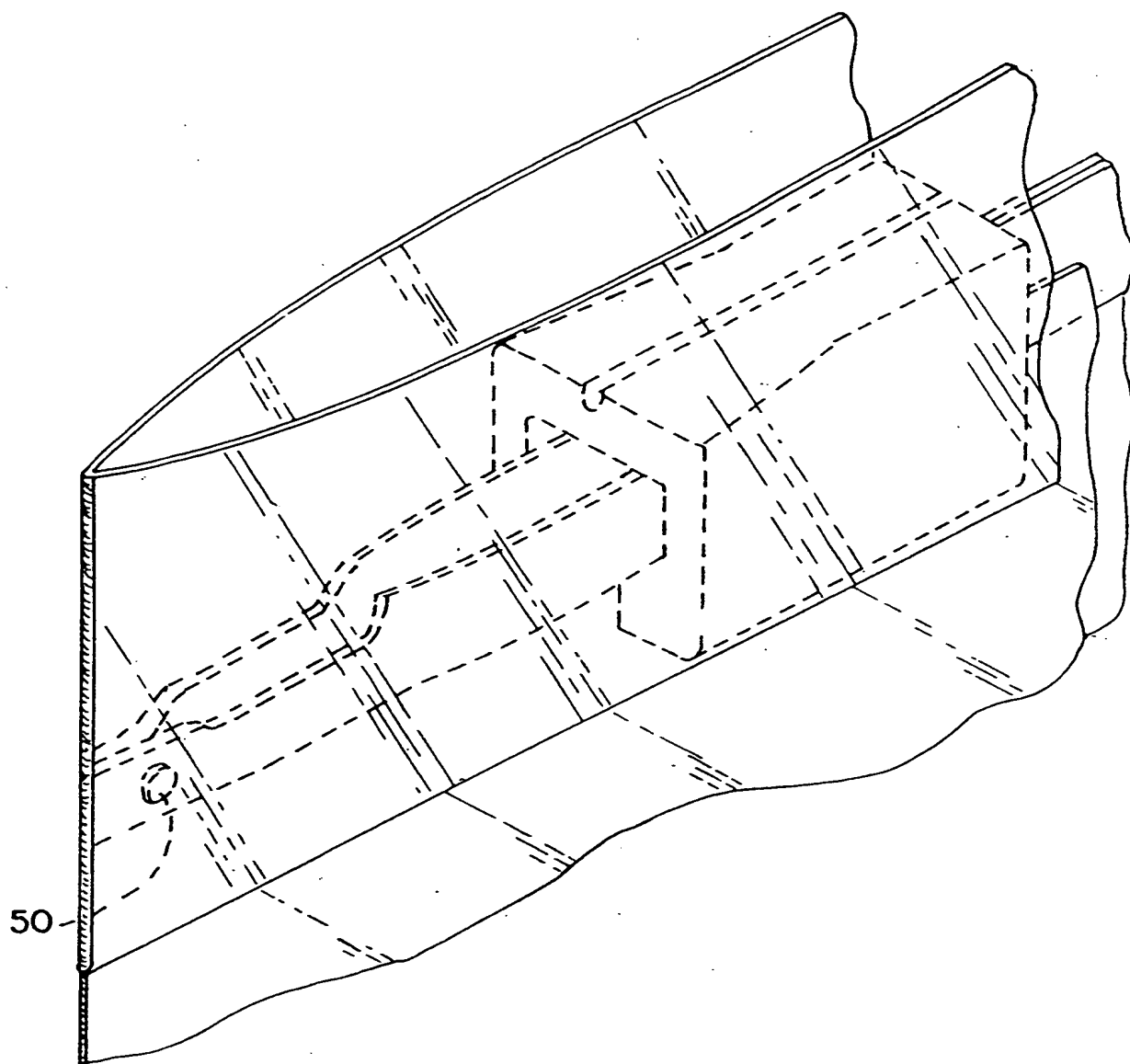
FIG. 3

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**FIG. 4****FIG. 5**

SUBSTITUTE SHEET (RULE 26)

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**FIG. 6**

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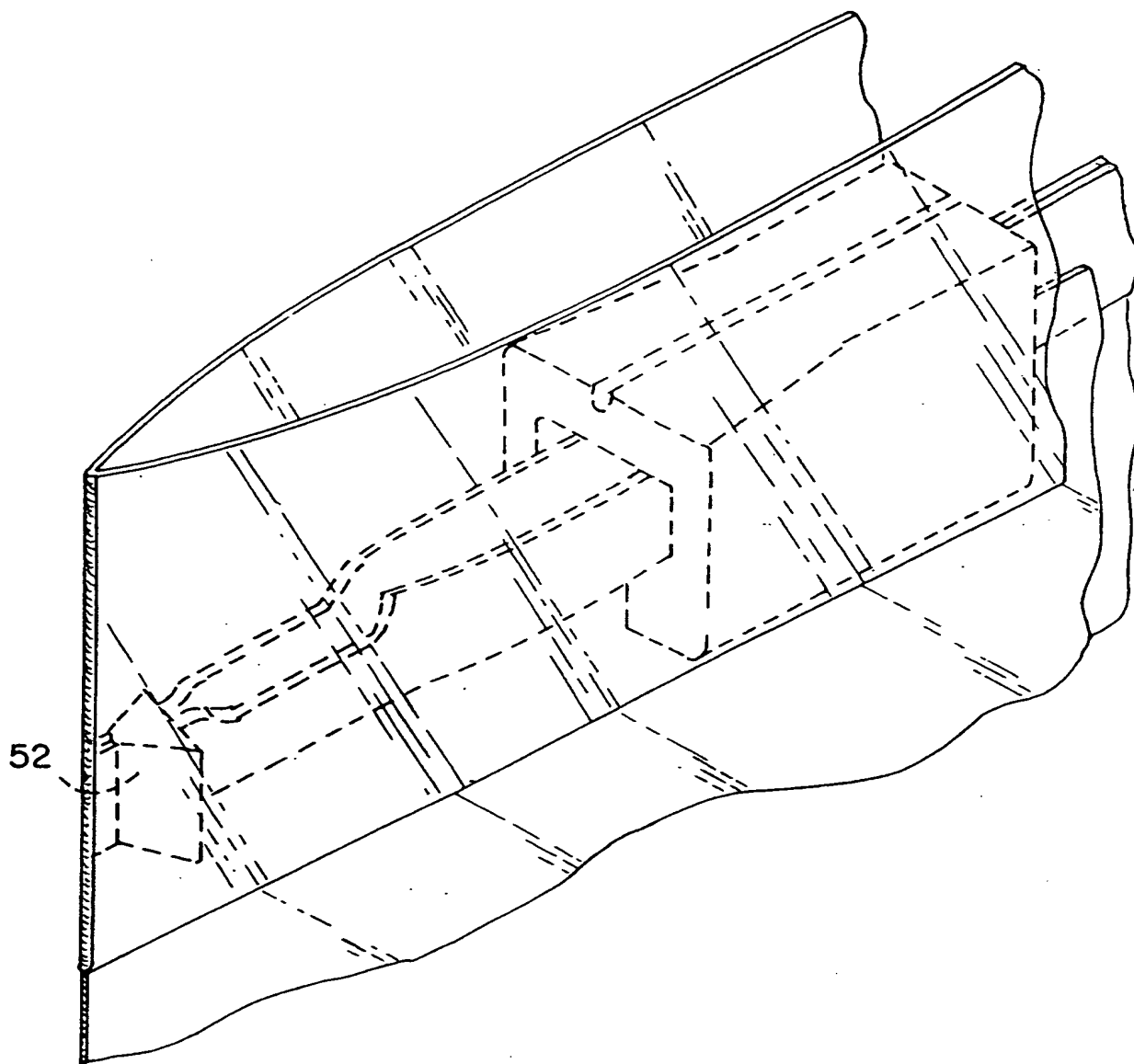


FIG. 7

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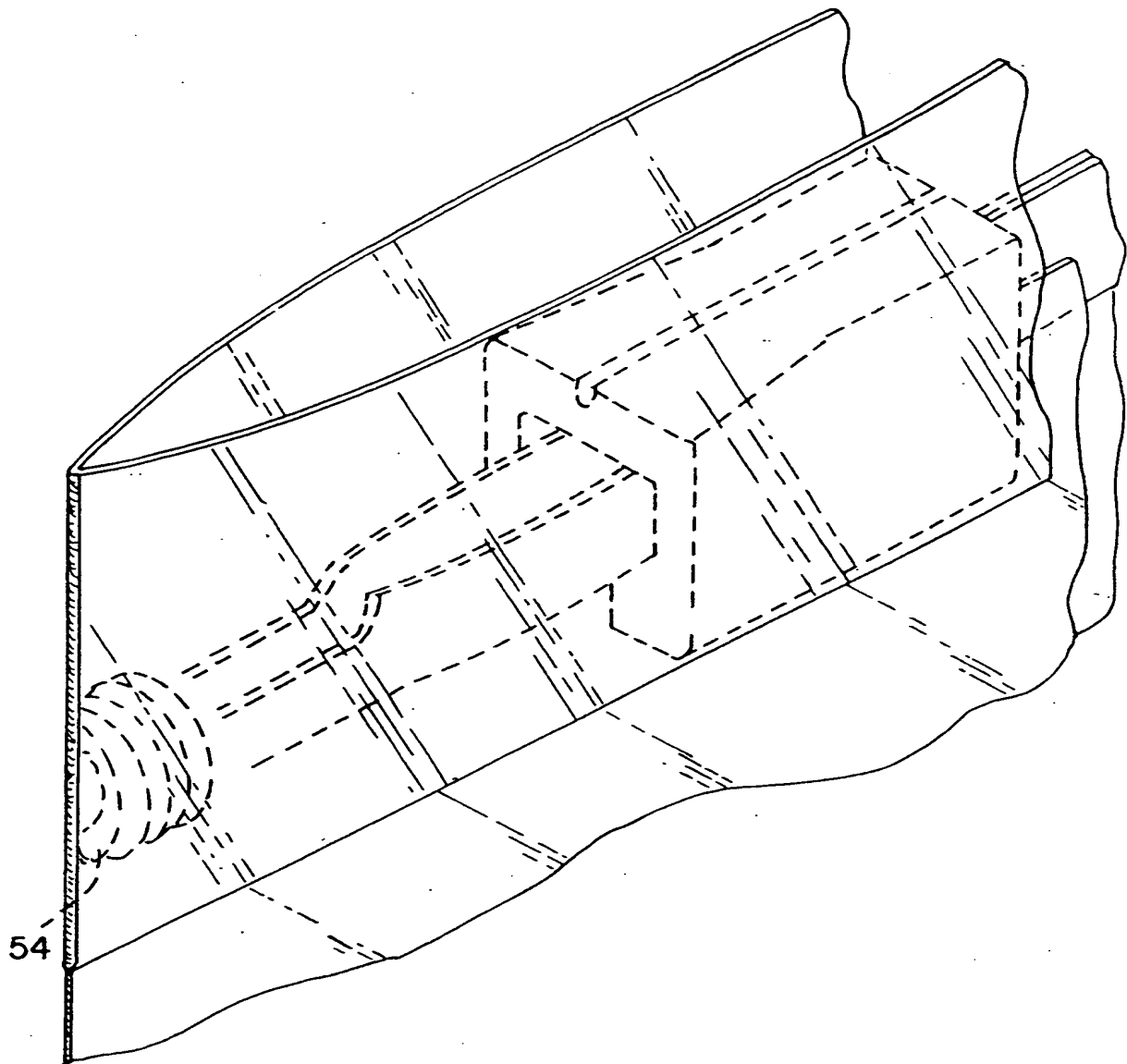


FIG. 8

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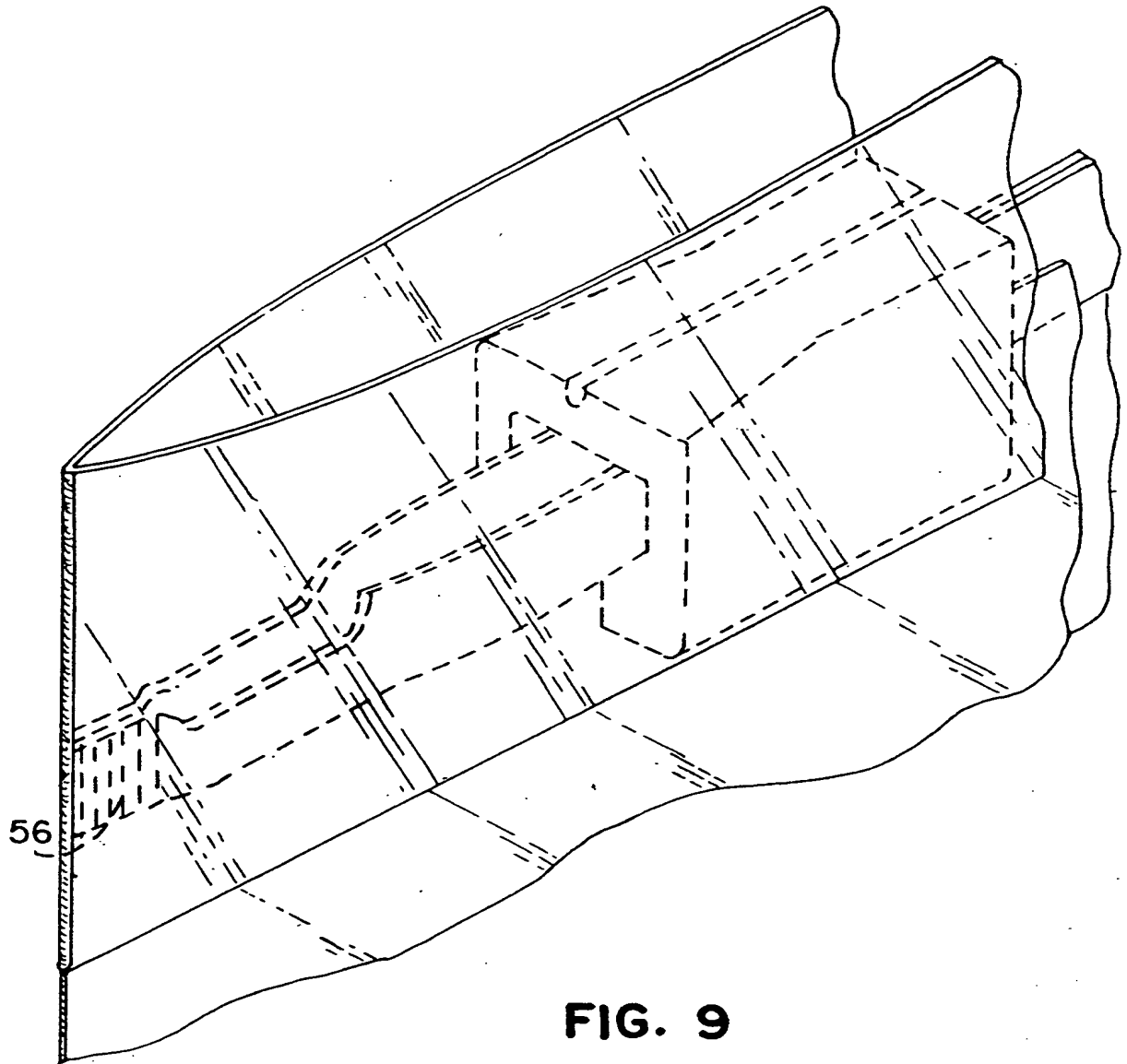


FIG. 9

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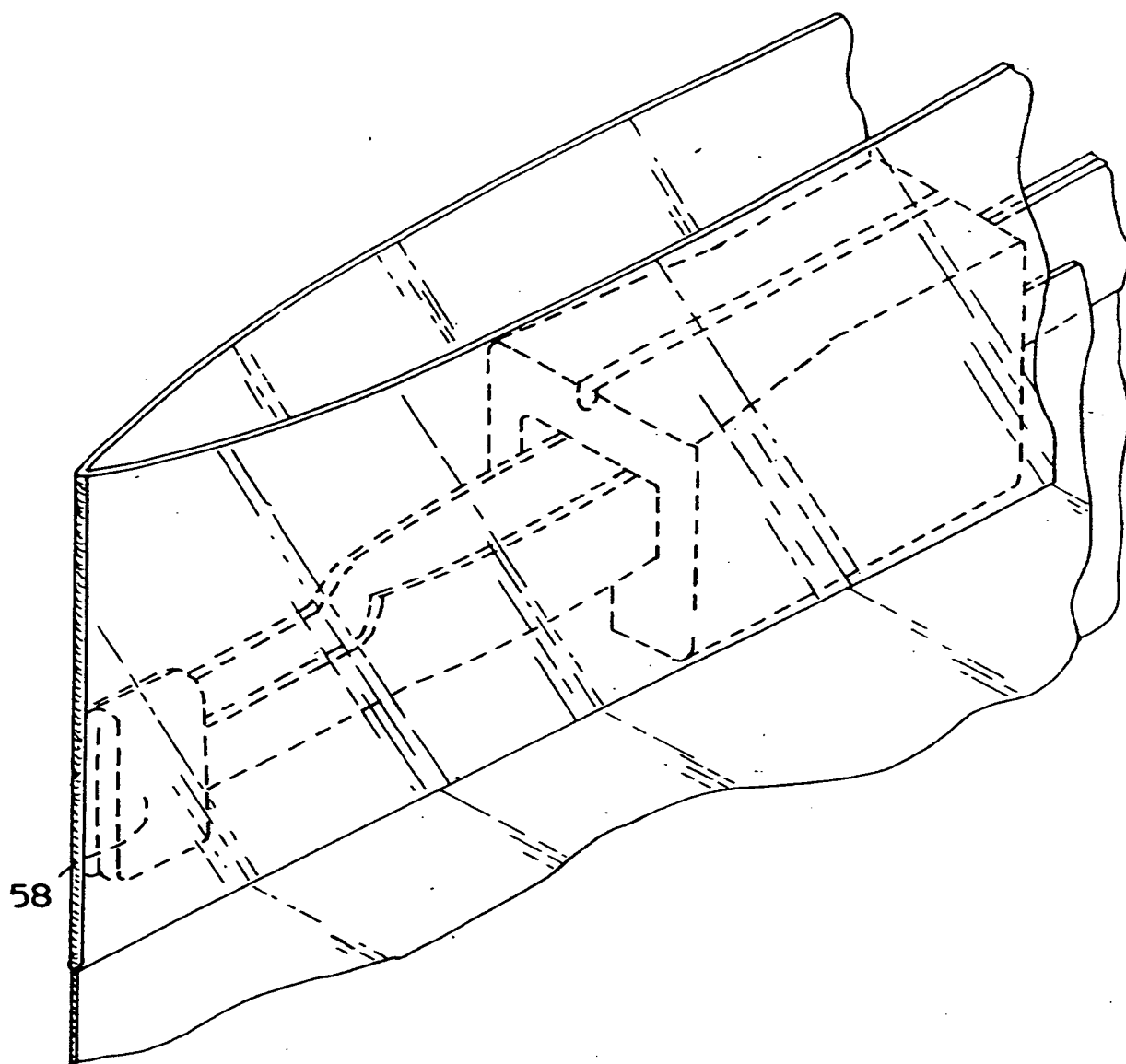


FIG. 10

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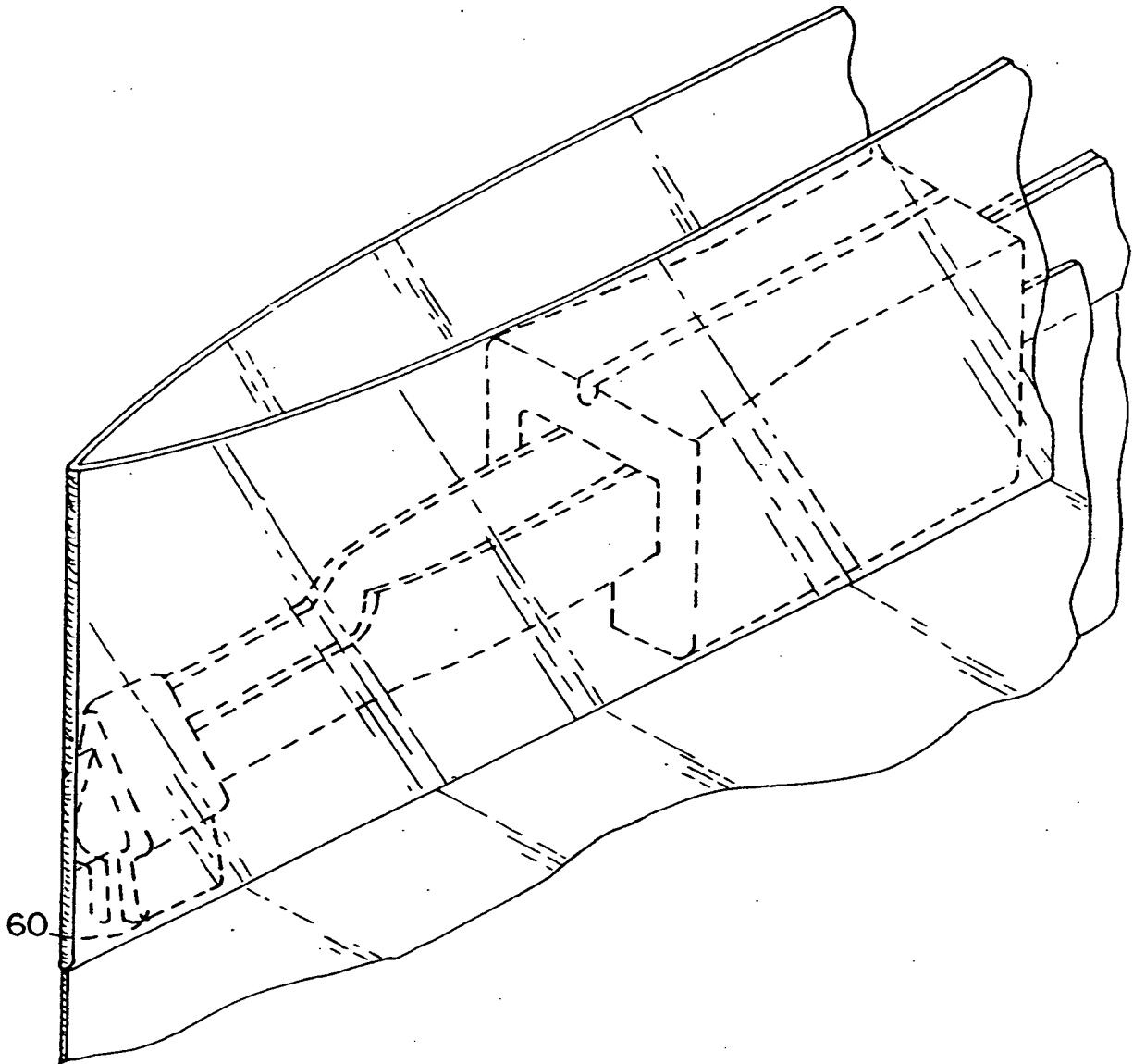


FIG. II

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/23542

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B65D 33/16
US CL : 383/61, 64, 81, 204, 209, 210; 24/435, 436, 399, 400, 587
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 383/61, 64, 81, 204, 209, 210; 24/435, 436, 399, 400, 587

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
None

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,067,208 A (HERRINGTON, JR. et al.) 26 November 1991, entire document.	1-4, 6, 7, 14-18, 20, 21 and 28
Y	US 5,088,971 A (HERRINGTON) 18 February, 1992, entire document.	1-5, 10, 11, 14-19, 24, 25 and 28
Y	US 5,448,807 A (HERRINGTON, JR.) 12 September, 1995, entire document.	1-4, 8, 9, 14-18, 22, 23 and 28
Y	US 5,482,375 A (RICHARDSON et al.) 09 January, 1996, entire document.	1-4, 12-18 and 26-28
Y	US 5,713,669 A (THOMAS et al.) 03 February, 1998, entire document.	1-28

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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